

CLAIMS

1) An olefin polymerisation titanium catalyst comprising a titanium compound and an organoaluminium compound cocatalyst supported on a soluble polysulfone comprising free reactive sulfone groups, wherein the molar ratio of titanium to aluminium is 1-10 : 200 and the weight ratio of titanium to polysulfone is 0.01 - 0.1 : 0.3 - 2.5.

2) A catalyst as claimed in claim 1, wherein the polysulfone is of the formula 1 :



Formula 1

wherein $X = Cl$, $R_1 = H$ or CH_3 and $n = 25-50$.

3) A catalyst as claimed in claim 1 or 2, wherein the olefin is ethylene.

4) A catalyst as claimed in any one of claims 1 to 3, wherein the titanium compound is titanium tetrachloride and/or titanium tetrabutoxide.

5) A catalyst as claimed in any one of claims 1 to 4, wherein the organoaluminium compound is methyl aluminoxane.

6) A catalyst as claimed in any one of claims 1 to 5, wherein the molar ratio of titanium to aluminium is 10 : 200.

7) A catalyst as claimed in any one of claims 1 to 6, wherein the weight ratio of the titanium to polysulfone is 0.04 : 0.3.

8) A process for the preparation of an olefin polymerisation titanium catalyst comprising a titanium compound and an organoaluminium compound cocatalyst supported on a soluble polysulfone comprising free reactive sulfone groups, wherein the molar ratio of titanium to aluminium is 1-10 : 200 and the weight ratio of titanium to polysulfone is 0.01- 0.1 : 0.3 - 2.5, the process comprising:

a) preparing a supported titanium compound by contacting a solution of a polysulfone in a halogenated or polar solvent with a titanium compound or a solution thereof in a halogenated or polar solvent in an inert atmosphere at a temperature between 10°C and the boiling point of the solvent, wherein the weight ratio of titanium to polysulfone is 0.01 - 0.1 : 0.3 - 2.5; and

b) mixing the supported titanium compound with an organoaluminium cocatalyst such that the molar ratio of titanium to aluminium is 1-10 : 200.

9) A process as claimed in claim 8, wherein the polysulfone is of the formula 1:



Formula 1

wherein X = Cl, R₁ = H or CH₃ and n = 25-50.

- 10) A process as claimed in claim 8 or 9, wherein the olefin is ethylene.
- 11) A process as claimed in any one of claims 8 to 10, wherein the titanium compound is titanium tetrachloride and/or titanium tetrabutoxide.
- 5 12) A process as claimed in any one of claims 8 to 11, wherein the organoaluminium compound is methyl aluminoxane.
- 13) A process as claimed in any one of claims 8 to 12, wherein the molar
10 ratio of titanium to aluminium is 10 : 200.
- 14) A process as claimed in any one of claims 8 to 13, wherein the halogenated solvent is methylene chloride.
- 15 15) A process as claimed in any one of claims 8 to 13, wherein the polar solvent is dimethylformamide.
- 16) A process as claimed in any one of claims 8 to 15, wherein the inert
atmosphere is provided by argon.
- 20 17) A process as claimed in any one of claims 8 to 16, wherein the supported titanium compound is prepared at 20 - 50°C.
- 18) A process as claimed in any one of claims 9 to 17, wherein the weight
25 ratio of the titanium to polysulfone is 0.04 : 0.3.
- 19) A process for the preparation of an olefin polymerisation titanium

catalyst substantially as herein described particularly with reference to Examples 1 to 6.

20) A process for the polymerisation of an olefin with a titanium catalyst comprising a titanium compound and an organoaluminium compound cocatalyst supported on a soluble polysulfone comprising free reactive sulfone groups, wherein the molar ratio of titanium to aluminium is 1-10 : 200 and the weight ratio of titanium to polysulfone is 0.01 - 0.1 : 0.3 - 2.5, the process comprises reacting the olefin with the titanium catalyst under polymerisation conditions in known manner.

21) A process as claim in claim 20, wherein the polysulfone is of the formula 1:



Formula 1

wherein $X = Cl$, $R_1 = H$ or CH_3 and $n = 25 - 30$.

22) A process as claimed in claim 20 or 21, wherein the olefin is ethylene.

23) A process as claimed in any one of claim 20 to 22, wherein the titanium compound is titanium tetrachloride and/or titanium tetrabutoxide.

24) A process as claimed in any one of claims 20 to 23, wherein the organoaluminium compound is methyl aluminoxane.

25) A process as claimed in any one of claims 20 to 24, wherein the molar ratio of titanium to aluminium is 10 : 200.

26) A process as claimed in any one of claims 20 to 25, wherein the weight ratio of the titanium to polysulfone is 0.3 : 0.04.

27) A process for the polymerisation of an olefin with a titanium catalyst comprising a titanium compound and an organo aluminium compound cocatalyst supported on a soluble polysulfone comprising free reactive sulfone groups, wherein the molar ratio of titanium to aluminium is 1 - 10 : 200 and the weight ratio of titanium to polysulfone is 0.01- 0.1 : 0.3 - 2.5, substantially as herein described particularly with reference to Examples 7 to 10.

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